REMARKS

Claims 1-16 are pending in this application. Applicants thank the Examiner for the indication that claim 15 would be allowable if rewritten in independent form. Because claims 1-14 and 16 are in condition for allowance at least for the reasons discussed below, it is respectfully submitted that the entire application is in condition for allowance.

The Applicant has found that a thermoplastic composite consisting essentially of:

- a base thermoplastic layer;
- a diffusing layer placed on one or both sides of the base layer, the diffusing layer constituted by a thermoplastic material containing barium sulphate in an amount by weight, expressed as % ratio on the total weight of the diffusing layer of 0.01 –2%,

when lit on one or more edges, achieves an improved light intensity and homogeneity on the panel.

The Examples provided in the present specification evidence also that, in order to achieve a more uniform diffusion of light on light diffusive panels, for the technical problem of the present invention, diffusive panels comprising thermoplastic sheets containing barium sulphate particles are unexpectedly more advantageous than diffusive panels of the same dimensions containing particles of other inorganic powders, such as titanium dioxide.

The Office Action rejects claims 1-14 and 16 under 35 U.S.C. 103 as being unpatentable over Kashima et al. (U.S. patent 5,442,523) in view of EP 0724181. This rejection is traversed.

The Office Action asserts that "[t]he base sheet of Kashima is capable of containing particles of substances diffusing light, both of polymeric and inorganic type" (see page 3, lines 18-20 of the Office Action).

However, Applicants respectfully note that nowhere in Kashima et al. is it stated that the base sheet is capable of containing particles of substances diffusing light.

Additionally, nowhere in Kashima et al. is **a light diffusing thermoplastic layer containing barium sulfate taught or suggested.**

light diffusing layer not thermoplastic

It is noted that Kashima et al. specifically state that the light conducting plate is made of a light transmissive material (see Kashima et al. column 1, lines 64-65); it is further noted that the light conducting plate in the Examples of Kashima et al. is made of PMMA (see column 7, lines 63-65).

Base layer in Claim 1

Therefore, contrary to the assertion in the Office Action, no inorganic particles are contained in the light conducting plate of the backlighting device of Kashima et al.

On page 6, lines 11-13 of the Office Action, it is asserted that "Kashima discloses the light conducting [plate] having light diffusing capability (column 2, lines 20-21)."

However, Applicants respectfully point out that the Kashima et al. light conducting plate has no diffusing capability per se. DRS

The light diffusing property pertains instead to the backlighting device, by applying the light diffusing material on part of the surface of the light conducting plate. In particular, Kashima et al. specifically disclose that "[t]o impart light diffusing ability to the light conducting plate one may apply a light diffusing material to part of the plate surface. Examples of light diffusing material include paints and printing inks..." (column 3, lines 4-8).

Kashima et al. describe an example at column 10, lines 8-11, stating that "[a] light diffusing material (a titanium white containing paint) was applied over the surface to the light conducting plate by screen printing a pattern of circular dots..."

Applicants respectfully point out that the light conducting plate used was PMMA (see above). Therefore the light diffusing capability of the conductive layer is due to the application to a part of the plate surface of light diffusing material, in the forms of inks or paints, as stated in column 3 of Kashima et al.

Regarding the same issue of the light diffusing capability of the conductive layer, it is also respectfully noted that the light diffusing material can even be absent in the backlighting device of Kashima et al., as is clear from column 3, lines 23-25, where it is disclosed that "[a]lternatively, the intended light diffusing capability may be provided by roughening the surface of the light conducting plate...."

Therefore the teaching of Kashima et al. is that the light diffusing material is not critical in order to obtain the backlighting device of Kashima et al., since it can be substituted according to the above statement from column 3, lines 23-25.

At page 7, lines 7-9, the Office Action asserts that "Kashima discloses a light diffusing material (film) applied over the surface of the light conducting plate (col. 8, lines 7-9). The method of applying the material is of little consequence because the product of Kashima reads on the structure of the instantly claimed invention."

Regarding this assertion, Applicants respectfully submit that the product of Kashima et al., when a light diffusing material is therein comprised, cannot read on the structure of the instantly claimed invention for the following reasons:

(a) **the light diffusing material of Kashima et al. is not a thermoplastic material**: inks and paints exemplified in column 3, line 8 are not known to be thermoplastic materials.

(b) **the light diffusing material** is applied to part of the light conducting plate (column 3, lines 4-7 of Kashima et al.) and therefore it **does not form a film**, as is formed in the case of the present invention.

For the Examiner's reference, it is respectfully noted note that a film is defined as "an extremely thin continuous (emphasis added) sheet of a substance." See the enclosed pages 388-389 from "The Condensed Chemical Dictionary 8th Edition."

On the same issue, it is further noted that the light diffusive material of Kashima et al. is applied to the surface of the light conducting plate by screen printing or printed in the form of dots or strips (see column 3, lines 20-22).

Comparative example 7 described, at column 12, lines 24-31, a luminance distribution curve e shown in Fig. 9 (sheet 7 of 8 of Kashima et al.) demonstrating that when the surface of the conductive plate is 100% covered (col. 12, lines 25-26), "a very uneven luminance distribution" is produced on the surface (column 12, line 31).

Therefore when a continuous sheet of diffusive material is formed on the conducting plate, there is not an homogeneous distribution of light intensity on the plate surface.

Therefore those of skill in the art would have been, based on the teachings Kashima, led away from the composite of the presently claimed invention for at least the following reasons:

(a) the backlighting device of the prior art must not necessarily comprise light diffusing material, since Kashima et al. teaches that light diffusing capability may be provided by roughening the surface of the light conducting plate, as said above.

(b) when the backlighting device comprises the light diffusing material containing inorganic particles, the teaching of Kashima is that said diffusing material must cover only part of the surface of the light conducting plate, otherwise the luminance distribution on the backlighting device surface is uneven. See above.

This effect is just the opposite of that given by the composite of the presently claimed invention.

Additionally, in Kashima et al. there is no specific teaching or suggestion to use barium sulfate particles rather than silica or the like in the light diffusing material. However, the present specification demonstrates that unexpectedly superior results and advantages are achieved using barium sulfate. Such unexpectedly superior results and advantages are nowhere taught or suggested by Kashima et al.

Regarding EP 0724181, the Office Action asserts in the 1st full paragraph on page 4 of the Office Action that EP 0724181 teaches "...a composite panel with a light reflective sheet in a back light unit under a transparent light guide with improved luminance (abstract) with a light diffusing sheet (page 4, line 17) having an average particle size of the inorganic filler... in the range of 100 to 300 parts by weight, where the inorganic filler is barium sulfate (pages 6, lines 20-31) and the amount of additive is 0.01 to 5 parts by weight (pages 6, lines 50-51)."

However, Applicants respectfully point out that, at page 4, line 17, the light diffusion sheet is indicated with reference numeral 5.

It is noted that, at page 11, lines 14-17 of EP 0724181 it is stated that "[a]s the light diffusion sheet 5 a polyethylene terephtalate sheet or a polyethylene terephtalate film whose surface is embossed can be used. Moreover, as the lens sheet 6, a polycarbonate sheet or a polyethylene terephtalate sheet whose surface is coated with a polycarbonate or a polyacrylate can often be used."

Therefore the light diffusing sheet, as it is defined in EP 0724181, i.e., the light diffusing sheet 5, contrary to the assertion in the Office Action, does not contain any inorganic filler.

Additionally, at page 7, lines 11-15, of the Office Action, it is asserted that "Applicant argues EP'181 does not disclose an inorganic filler in the diffusing sheet but the reflecting sheet...EP'181 teaches a light diffusion sheet formed of polyethylene terephalate (page 11, line 14), where the PET (light diffusion sheet) contains inorganic filler (page 14, line 54).

However, page 14, line 54, refers to example 11. Lines 54-56 of said example describe that a white PET film containing an inorganic filler and having a total light transmittance of 12.5% was laminated as a light leakage preventing auxiliary layer on the back surface of the porous resin sheet of Ex. 1 (see page 12 of EP 0724181).

Page 9, lines 28-29, of EP 0724181 explains what is meant to be a light leakage preventing auxiliary layer. It is therein stated that in the third embodiment of the invention a film having low transmission (a total light transmittance less than 20%) is used as a protective layer and that this film is laminated on the back surface of the porous resin sheet. Lines 30-31 state that this protective layer is called light leakage preventing auxiliary layer in order to further heighten the reflectance of the light

reflective sheet. Further, lines 33-36 state that "[w]hen such a film having the low light transmission is laminated on the back surface of the porous resin sheet, even the light which is not reflected on the porous resin sheet layer and which is transmitted therethrough can efficiently be reflected on the film towards the porous resin sheet" (emphasis added).

Therefore Applicants respectfully submit that page 14, line 54, cited in the Office Action refers to a reflective sheet, not to a diffusive sheet.

On the basis of the combination of the above two references, the Office Action has asserted that "it would have been obvious to one of ordinary skill in the art to include the thickness of the light diffusing layer, the amount by weight and particle size of barium sulfate in the composite panel of Kashima".

However, as the Applicants have herein above shown, the light diffusing sheet 5 of EP 0724181 does not contain any inorganic filler and in the backlighting device of Kashima et al. the light diffusing material can also be absent.

Therefore it is respectfully submitted that the presently claimed invention would not have been obvious to those of skill in the art, particularly since in Kashima et al. there is an alternative way of providing light diffusion that avoids the use of light diffusing material.

It is also respectfully submitted that those of ordinary skill in the art would not have been led to use barium sulfate to make a light diffusing thermoplastic sheet to obtain a composite having an homogeneous light distribution on the basis of EP 0724181 teaching the use of a barium sulfate in reflective sheets.

Referring to the last lines of paragraph 4 on page 4 of the Office Action, "one of ordinary skill in the art would understand how to adjust the amounts and particle size of barium sulfate based on the amount of light desired to be diffused."

Apart from what it has been said herein above, this objection is untenable, since in EP 0724181 the sheets containing barium sulfate are reflective sheets. The prior art does not teach or suggest to the skilled how it could be possible, starting from the wt % of barium sulfate in a reflective sheet, to draw the wt % of the same compound to prepare such a light diffusing thermoplastic sheet to give an homogeneous light intensity distribution on the surface of the panel.

It is therefore respectfully submitted that one of ordinary skill in the art would not have understood how to adjust the amounts and particle size of barium sulfate based on the amount of light desired to be diffused.

Therefore the presently claimed invention would not have been obvious over the above references, alone or in combination.

Applicants also take this opportunity to clarify several additional issues.

In the "Response to Arguments" section on pages 5-7 of the Office Action, at page 5, lines 11-18, the Examiner takes the position that in Kashima et al. the polycarbonate sheet possessing multiple parallel linear prism is not critically essential to the invention therein. However, it is noted that in the paragraph "Detailed Description of the Preferred Embodiments", column 2-4 of Kashima et al., reference is made to Fig. 3(b) (column 3, line 6) or both to Fig. 3(b) and to Fig. 4(b) (column 3, line 66; column 4, line 39). Applicants note that both Fig. 3(b) and 4(b) comprise sheet 7. At column 4, lines 15-19, it is stated that a "sheet 7 made of a light transmissive material...has

multiple parallel straight ridglines or pyramidal or conical projections that are formed at minute intervals on the same side." Therefore the assertion in the Office Action is groundless since the sheet possessing multiple parallel linear prisms is critically essential in Kashima.

At page 6, lines 20-21, of the Office Action, it is asserted that "Applicant further argues diffusion is obtained by roughening the surface of the light conducting plate, which is held to a product by process limitation." It seems that the argument of page 6, lines 7-10 of the Amendment filed on March 20, 2003, has been completely misunderstood.

The Applicant wishes herein to make even more clear that in the Amendment, the above statement was referring to the Kashima et al. disclosure at column 3, lines 20-21, that as an alternative to dots and strips print, the light diffusing capability may be provided by roughening the surface of the light conducting plate.

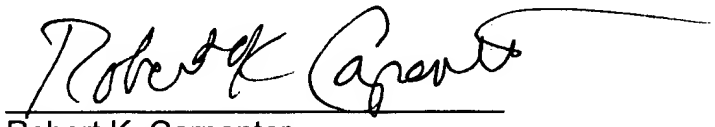
Absent any teaching or suggestion of the present invention in the two applied references, taken alone or in combination, the patentability of the present invention should be acknowledged. For at least the above reasons, reconsideration and withdrawal of the rejection of claims 1-14 and 16 under 35 U.S.C. § 103(a) are respectfully requested.

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone

number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event this paper is not considered to be timely filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing attorney docket number 108907-09021**.

Respectfully submitted,



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